

REMARKS

Claims 1, 3-6 and 8-15 are pending. Favorable reconsideration is respectfully requested.

The present invention relates to a polyether obtained by reacting 1-butene oxide and an alcohol in the presence of a double metal cyanide compound as a catalyst, where

the content of unsaturated components is 6 mol% or more, and

the content of unsaturated components is from 7 mol% to 50 mol%.

See Claim 1.

The rejection of the claims under 35 U.S.C. §103(a) over Le-Khac in view of Combs et al. is respectfully traversed. The cited references fail to suggest the claimed polyether.

Le-Khac discloses polyether polyols prepared by polymerizing an epoxide with a hydroxyl group containing initiator in the presence of a double metal cyanide (DMC) catalyst. Butene oxide is disclosed as possible epoxide, however, all the examples are based on propene oxide.

Le-Khac teaches that polyether polyols prepared with the DMC-catalyst of Le-Khac have a content of unsaturated products which is less than 6 mol-% (less than about 0.007 meg/g), see column 7, lines 2 to 12). Table 4 of Le-Khac discloses polyether polyols based on propene oxide having a content of unsaturated components of from 0.007 mol-% to 0.034 mol-% (0.003 to 0.006 meg/g, according to Le-Khac) and of from 0.024 mol-% to 0.042 mol-% (0.010 to 0.019 according to the prior art). The conversion is based on the assumption that meq/g corresponds to meg/g to mg(I₂)/g(polymer).

Accordingly, Le-Khac does not disclose the polyether polyols obtained from butane oxide having a content of unsaturated components of at least 6 mol-% as claimed.

In addition, Le-Khac does not provide any incentive to someone skilled in the art to make polyether polyols according to the invention. Even in the first section of Le-Khac

(Filed of the Invention) it is stated that the polyether polyols products described therein have exceptionally low unsaturations. In column 2, lines 16-20, it is further disclosed that the adverse effect of polyols unsaturation is well known.

The situation does not change if Le-Khac is combined with the teaching of Combs et al. Combs et al. teaches poly-oxyalkylene monoethers as components for fuel additive detergent systems.

Combs et al. explicitly teaches that also for this application a content of 6 or more mol-% of unsaturated compounds is disadvantageous. It is stated (column 2, lines 26-30) that polyoxyalkylene monoethers containing less than about 6 mol-% of unsaturates offer substantial advantages for fuel. All the examples are based on propene oxide, not butane oxide. Accordingly, the teaching of Combs et al., if combined with Le-Khac, does not provide any further motivation to make the polyether polyols of the invention. On the contrary, the combined teaching Le-Khac and Combs et al. leads even further away from the invention.

In addition, while the cited references are concerned with DMC-catalysis focus on polyether polyols based on propene oxide, the inventors of the present invention have explored compounds based on butane oxide. Surprisingly, it was found that in case of butane oxide DMC-catalysis - contrary to the teaching of the cited references - leads to an increased amount of unsaturated in comparison to traditional KOH catalysis (see specification, page 1, lines 5-21, and page 12, example 1 - comparative example). Simply put, the effects of traditional KOH and DMC catalysis are exactly opposite for propene oxide and butane oxide. In the first, case KOH catalysis leads to a higher amount of unsaturates, in the latter it is DMC catalysis! Even more surprisingly it has turned out in spite of the strong conviction to the contrary in the cited documents the compounds of the invention with a higher amount of

unsaturated components show no performance losses compared to classically prepared carrier oils (specification page 2, lines 10-18, table 1 to 4).

These two surprising results could not have been derived from Le-Khac and Combs et al. Accordingly, the invention is not obvious in view of those references. Withdrawal of this ground of rejection is respectfully requested.

Applicants submit that the present application is in condition for allowance. Early notice to this effect is earnestly solicited.

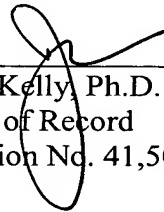
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